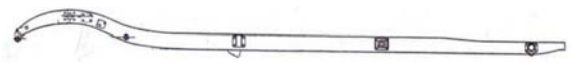
From the Frame Up, LLC



Tech Tips:

TC Rear Axle Oil Leak Prevention
CH201 – Rear Axle Upgrade & Oil Seal Conversion Kit

One of the common problems with the TC rear axle is that oil leaks from the axle onto the brake drum assembly. The original factory design to prevent such an occurrence was the use of a bronze “oil slinger” pressed into the end of the axle housing itself. There is a right and left slinger that has a slight grove cut into it to return the oil back into the housing as the axle shaft rotates. Even with a new slinger there is the possibility for continued leaking and seepage. Therefore, a modern day solution is offered to prevent the oil leak and improve the servicing of the rear axles themselves.

The following items are recommended to be replaced with those items listed:

#	**Original Items**	**CH201 - Replacement Items**
1.	Bushing, oil slinger (R/L)	1. NA - Remove or leave originals in place
2.	Bearing housing oil seal	2. Bearing Housing Seal: (2)
3.	Rear axle bearing	3. Rear axle “sealed” bearings (2)
4.	Bearing lock nut, (R/L)	4. Bearing “hex” lock nut, (R/L)
5.	NA	5. Modern oil lip seal - inside lock nut (2)
6.	NA	6. Speedi-sleeve (2)
7.	NA	7. Specialty Shims -Hub to bearing (combo set)
8.	Tab lock washer	8. Tab lock washer for new “hex” nut (2)

The following steps are provided to help in removal and replacement of the above mentioned parts.
Removal:

1. Jack up the rear of the car and remove the wheel, and the brake drum.
2. Remove the rear hub with the axle shaft pressed into it by separating the rear hub from the rear bearing housing. This will expose the rear axle lock nut, holding the rear bearing in its housing, to the rear axle housing.
3. Remove rear axle nut. If you have the old style this may require a cold chisel. Do not try to save this nut.
4. Remove the bearing from the bearing housing. If possible leave the present oil seal in place on the back of the bearing hub. If removed, try to avoid damage as it can be reused.
5. Clean the bearing hub. If the rear axle has been leaking oil then it is obvious that the brake assembly may also have to be dismantled and cleaned. The brakes will not be discussed here other than the fact that if the shoes are oil soaked, then the linings need to be replaced.

Reassembly:

6. Check to see that the rear axle (half shaft) is pressed tight into the rear hub. This can be checked by the simple test of dropping the axle end on a concrete floor. You should hear a distinct bell-like ringing. If it does not have a clear ring then you should replace the axle shaft and or hub. (If you replace the half shaft, the installed finished distance from back of hub to end of half shaft is 21 7/16".)
7. Press the new "sealed" bearing into the rear bearing housing. Then install the oil seal into the back of the bearing housing. The old seal is perfectly acceptable because the bearings are sealed and protect themselves. This seal is only a "dust excluder". Therefore, you do not need to replace this item if the seal has not been damaged during the replacement process.
8. Position the bearing housing, with bearing and seal installed, on the end of the axle housing. Then install the lock washer tab. There are sometimes variations in these requiring that you file the inner tab to fit correctly in the axle slot.
9. Next, install the new hex nut and seal with the seal towards the outside of the car. Note that the left handed nuts have a slot in their outer perimeter (for identification) and go on the left side (near side). This is opposite of the wheel spinners which are right turn to tighten on the left side. Just snug the nuts for now. DO NOT BEND LOCK TABS YET. The hub will need to be "test fit" in a moment.
10. **Notes on Speedi-sleeve:** The purpose of the speedi-sleeve is to give a smooth running surface for the new lip seal to ride on. When the half shafts are pressed into the hub, there are normally some exposed splines remaining. These splines will eat the new seal if they run under the seal itself. It may not be necessary to use a speedi-sleeve if you have new tapered half shafts, or if there are minimal exposed splines. However this set is provided with a speedi sleeve and appropriate 1.125" ID lip seal. If you choose not to use the speedi-sleeve provided then you must have a smaller diameter lip seal which is 1" ID, which is the standard ½ shaft diameter.
11. To install the speedi-sleeve: The sleeves must be installed with epoxy resin glue. (JB Weld or Araldite, outside the US) Clean the shaft with a good degreaser, then fill the visible splines behind the hub with glue. Then slide the sleeve down the shaft and tight against the hub. Once in place twist the sleeve to spread the glue beneath. Keep in mind that the glue also provides a barrier to prevent oil seepage under the sleeve. The goal is to have enough to secure the sleeve and to have a continuous barrier to prevent oil leakage between sleeve and shaft. Remove any excess glue on exterior of sleeve before it dries.
12. Some shafts may be slightly oversized from 1". If the sleeve is too tight on the shaft, it may be necessary to file a few strokes with a fine round file to open up the inside sleeve diameter.
13. **Notes on speedi-sleeve clearance with existing "old oil slinger".** The sleeve should not come in contact with the old oil slinger. However, this cannot be guaranteed because of variations of the depth of previous install of the oil slinger. If you have your rear axle housing totally disassembled it may be prudent to totally remove the oil slinger. It serves no purpose with the new modern lip seal installed. Also, if the oil slinger is left in place it may be necessary to slightly recess it further into the housing to provide clearance between the new sleeve and the old slinger. However, you won't know if there is contact between the 2 until the test fit. You should also at this point inspect the old slinger to check the

security within the axle. If it is loose at all, it should be removed or else you may find it spinning on the axle shaft someday and wonder what the noise is. Also check the depth of recess of the slinger to have a reference measurement to compare to depth of new sleeve.

14. Now, **test fit** the hub and half shaft. Pre-lube the new lip seal with grease. Then slide the hub with shaft into the axle housing and differential. Draw the hub and axle housing together with a couple nuts. Check that the sleeve does not "bottom" against the slinger. If it does, tap and recess the slinger slightly into the axle housing and again check for security.
15. When satisfied, remove hub and tighten the new hex nut to 110-130 ft-lbs torque and bend 2-3 locking tabs on the hex nut. To tighten use a 50mm or 2" socket. The 2" has a little play but will work fine.
16. The final task is to **fit the hub to bearing housing**. Slide the hub with axle shaft into the rear axle housing and differential. Clamp or draw the hub and bearing housing together with a few nuts on the studs to check the gap between them. It should be at approximately .004" or greater. It is important to note: the hub and bearing housing holds the outer bearing race tight so it does not spin in the housing. So this is the objective of making sure this gap is correct.
17. **If the gap is .004" or wider**, then you can put things together. Use a non hardening gasket sealer and secure the hub. Originally, there was a paper gasket used for this task but is not considered necessary today. However, if you do use a paper gasket make sure that there is still at least .004" gap with it installed. When satisfied, spread the gasket sealant, position the brake drum and secure tightly.
18. **If the gap is less than .004",** then there is another problem that has to be solved. This means that the hub is not tight against the outer race of the bearing and it may be that the bearing will spin in the housing. The solution is to install a shim between the hub and outer race of the bearing. (If you have had a negative camber on your back wheels, this may have been the problem.) Through trial and error, select a combination of shims to yield the desired goal of .004" gap between hub and bearing housing. When satisfied, spread the gasket sealant, position the brake drum and secure tightly.
19. To install the brake drum, align the countersunk holes in the brake drum with the threaded holes in the bearing housing (not the hub) and draw together with 5/16 BSF machine screws. Then install the 6 nuts and lock washers on each stud to complete the task.
20. Install wheel and you are done.

Final note: It is recommended that after this seal conversion that you re-inspect the new lip seal annually or at 5000 miles. This seal should last a long time. However, poor hub bearings or worn splines will allow excessive movement and possible premature failure. If there are any signs of deterioration, replace the seal and investigate the reason for failure.

Safety Fast!

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